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Avoiding Sedentary Work: Exploring Motivational Issues

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Abstract. In this paper we present a qualitative study on motivations for avoiding sedentary work. Sedentary work has been recognized as a significant public health problem and many workplaces now invest in initiatives to support employees in avoiding it. The initiative in focus here include bikes, treadmills, step machines and adjustable workstations combined with a digital platform to keep track of activities and to make relevant information available. Experiences indicates that while employees are excited at the beginning, the use of exercise tools drop relatively fast. In order to understand motivation for use, clarify challenges and identify opportunities to support use of exercise tools through the digital platform we did interviews with employees and decision makers from four different companies. The overall challenge identified was pressure of busyness and reasons for use was due to individual objectives. Thus, in order to support employees in avoiding sedentary work the digital platform should provide facilities which allow for formulating and pursuing individual objective.

Keywords. Sedentary work, interventions, ecological approach

1. Introduction

Sedentary behavior (from Latin *sedere* – “to sit”) is the term used to characterize behaviors that involves sitting and low energy expenditure (1.0-1.5 metabolic equivalents), such as computer use, driving, and television viewing. [1] Contemporary changes in work, transport, domestic activities, and leisure time in general have led to more time spent in sedentary behavior, and this behavior has been recognized to play a significant role in the development of chronic diseases such as type 2 diabetes, musculoskeletal symptoms, cardiovascular diseases, obesity and premature mortality. [2, 3] Furthermore, research also indicates that negative effects associated with sedentary behavior are independent of efforts to meet general recommendation of daily physical activity [4] which is typically 30 minutes a day, e.g. [5]. Reducing sedentary behavior at work is especially important as work take up a large part of the day’s hours, and a study from US shows that over the last decades the proportion of sedentary occupations has increased [6].

Interventions strategies to avoid sedentary work have been categorized in slightly different ways. According to a review, based on 26 intervention studies, presented by Chu et.al. strategies can be divided in educational/behavioral strategies, environmental strategies and multi-component strategies [7]. Educational/behavioral strategies involve

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educational initiatives for adoption and maintenance of behavior change, and providing motivational signs like so called decisions points placed on or near stairwells, elevators, and escalators to encourage individuals to use stairs. The educational/behavioral strategies have been explicated in the CALO-RE taxonomy covering 40 items of behavioral change techniques [8]. Environmental strategies involve changes in environment like providing access to adjustable work stations, bikes, treadmills, step-machines and the like. Multi-component strategies are combining educational/behavioral and environmental strategies. All the mentioned strategies are found to have some effect, with the multi-component strategies evaluated as the most effective.

Other studies operate with the same categories but add an organizational or policy level to the strategies and designate this as an ecological approach [9, 10, 11, 12] to address the problem of sedentary behavior. Hutcheson et al in their review, based on 15 intervention studies, describe four core principles (based on [11]) that characterize an ecological framework [12, p. 42] (1) health behaviors are affected by more than just intrapersonal (knowledge or skill)-levels factors, (2) factors affecting health behavior interact across different levels (3) potential factors influencing health behavior should be identified at multiple levels, and (4) interventions focusing on multi levels of influence should be most effective in producing the desired change.

There seems to be an agreement that interventions of the mentioned types in general shows some effect and that multi-component strategies involving the organizational/political level are the most effective. However, a majority of intervention studies are short-term intervention, and the rather few longer-term interventions shows a decline in activity. This make the authors of [9, 12] to point to the need for long-term evaluations on the one hand, and to suggest, on the other hand, that some of the effects of the interventions might be due to novelty or excitement, whereas in the long run employees return to their ordinary (sedentary) habits.

In our study we address the question of employees' motivation for use, and thus add to the understanding of long-term effects of interventions directed at avoiding sedentary behavior at work. We focus on actual use-practice and the challenges experienced with the aim of identifying ideas and opportunities to support use of exercise tools mainly through the digital platform.

2. Case

The company that we cooperate with offer a multi-component strategy to combat sedentary behavior at work. The strategy consists of bikes, treadmills, step machines, adjustable desks and other exercise artefacts. This is combined with a digital platform where the users can register activities (biking, walking, stepping, standing or other exercises), participate in event and challenges, watching video instructions targeting specific problems e.g. back pain, getting general information, and participate in various forms of competitions. Furthermore, apart from the possibility of monitoring own performance the digital platform also provide access to data from own company, departments, section as well as data from other companies and institutions. Thus, you can set up an event, like reaching La Rambla in Barcelona, and compete with another section e.g. in your own company, on who is arriving first, deciding that the losers serve tapas and sangria for the winning team. Or participating in a four-week squat challenge starting with 10 squats the first Monday and ending with 105 squats the last Friday. The digital platform is web-based, but also available as an app.

Apart from exercise artefacts and the digital platform the implementation of this concept involves a kick-off meeting and the nomination of one or more health ambassadors. At the kick-off meeting all the employees at the specific site is informed on the importance of avoiding sedentary behavior and instructed in how to use the exercise artefacts and the digital platform. The overall message is that a small effort, like standing up 30 minutes a day, make a huge difference in the overall health status. The health ambassadors are nominated by their own company and their role is among other things to act as mediators between the costumer and the company selling the multi-component strategy.

The company is around 4-year-old and already have many costumers from private companies and public institutions, mainly in Denmark but also in Scandinavia and Germany. The concept is still under development and especially the design and use of the digital platform is in focus. The company receives continuous suggestions for improvement to the digital platform from the costumers. These suggestions concern both small improvements to the current functionality, such as a possibility to add more participants to an ongoing challenge or easier registration, and more general comments, such as improvement of the visual experience, the request of the app/web to work faster, or the need of functionality to motivate colleagues. The company's own idea on how to improve the digital platform concern adding more possibilities for various kinds of competition, and also the inclusion of nudging elements.

The overall experiences are as mentioned that while the employees are enthusiastic at the beginning, the use of exercise tools drop relatively fast at least for a god deal of the employees. In order to understand use practice, the challenges involved, and eventually point to functionalities and procedures that might support a more constant use of the concept we did an exploratory pilot study.

3. Methods

The study is based on qualitative interview. Staff from four different companies/institutions where interviewed, 9 persons in all. One interviewee came from a company who decided not to buy the concept after a 3-month testing period. The remaining came from companies that have had the concept installed for a period between 5 months and 2 years. The interviewees where all users or potentially users of the concept, but also had different roles. Thus, we did interviews with one decision maker, one health ambassador and one ordinary user at two of the companies, and one decisionmaker and one health ambassador from one company. We were both present at the interviews, which took place at the company site, also given us the opportunity to see how the exercise artefacts was placed in the environment.

In order to understand the use-practice and the challenges experienced by the employees we asked two types of questions. On the one hand we posed very specific questions on what, when, how, why and why not. E.g. we asked if and when they have used the exercise artefacts lately, if they have used them today, for how long, what triggered the activity, what where they working with while they were using it? What was the reason for not using the exercise artefacts. We posed similar specific questions concerning the use of the digital platform. This approach was inspired by contextual inquiry [13]. The other type of questions, inspired by the narrative interview form, addressed the meaning, significance, and value of the concept. E.g. we asked questions on if and how and with whom the interviewees talked about the concept, how would they

characterize the value of having access to the facilities, did they participate in competitions, did they feel any pressure from colleagues etc. These questions were asked to all participants.

Decision makers were further asked why they have chosen to implement the concept, if they did any kind of monitoring of the use, if sickness absence had gone down, and how they evaluated the success or failure of the concept. Additional questions to health ambassadors included, how they got the role (voluntary or appointed), task and responsibilities, contact with other health ambassadors, and so on.

Interviews had a duration of approximately 30 minutes, were audio recorded and data was manually coded by both authors separately, in order to clarify the themes of reasons for use, role of health ambassadors, general use practice, challenges for use, and ideas and wishes for the digital platform.

4. Results

According to the decision makers, the choice of introducing the exercise concept was due to concerns for the overall working environment, and not just for health reasons. In one of the organizations there was a history of problems in the work setting with massive notifications of illness as a result and the exercise concept was one of several initiatives made to change this situation. Thus, the intention focused more on creating a sense of community among members of staff, than on the actual exercise. Other decision makers state the reason for adopting the exercise concept as an additional benefit for the staff in line with e.g. high-quality lunch and access to a physiotherapist. There was no specific monitoring of use in any of the organizations/companies.

The role of health ambassadors was to act as mediators between the company selling the exercise concept and the costumers. In general, the ambassadors were voluntary appointed, meaning that decisions makers appointed people they knew were interested. Some understood their role as those who had to set a good example for the others, e.g. raising the table or using the bike on a regular basis. Others conceived themselves more as facilitators, e.g. taking responsibility for providing a reservation system for the exercise artefacts and making sure they are repaired if broken. Some had a regular contact with one or more health ambassadors from the same organization/company and some had not. Overall there were some confusion on the role of the health ambassadors and the respondents said that this was something they had to discuss further.

It was mentioned in all three companies/institutions that after the first couple of months excitement the use of the exercise tools declined for a part of the employees. Several reasons for this were mentioned, some said that they never really got started after the summer holiday, others that it had been too hot, or it was difficult when wearing high heels or flip-flop shoes, but the main explanation was bustle. When very busy at work they tended to stop using the exercise tools. One explained that for example in order to bike when working, you must have everything you need within reach, and even getting something from the desk drawer is difficult while sitting at the bike. Once you have stopped it can be difficult to get started again.

As for the employees who continued to use the exercise tools regularly, the main explanation was found in individual circumstances. That is, exercise help you keep depression at a distance, or keeping your cholesterol down, or give less back pain and so on. It seemed as if the competition element (competing with other groups in the same company or with other companies) that played an important role in the beginning became

less important over time. This might also have something to do with the fact that registration of how far or for how long time you have biked, walked or stood had to be manually done. Generally, people were quite happy with the digital platform, but we learned that it was rather diverse what was recorded which also made it difficult to compare activity between departments and companies. The digital platform also provided different challenges, like wall sitting or squat challenges, but what was especially appreciated and motivating was specific information like “If you stand up at your desk every day for 2 hours in a year then it corresponds to running 6 marathons”. Also, some of the decisions makers and health ambassadors asked for strategies that could help people to get started again.

This pilot study reveals that the main motivation for employees to continuously use the exercise tool are due to individual circumstances such as keeping e.g. depression or back pain at a distance. The more competitive element seems to be less important. However, this can also be due to the fact that registration of activities is experienced as difficult. In general, these indications from our pilot study, need to be explored on the basis of more data on user practice and challenges experienced by the users.

5. Conclusion

Based on this pilot study we can conclude that the exercise strategy is implemented to afford a sense of community and at the same time provide the employees with a possibility of doing exercise while working. The role of the health ambassadors could be clearer. Motivation for regular use is primarily due to individual reasons. The digital platform should allow for formulating individual objectives, provide functionalities for easier registration, and deliver timely and specific information on health issues.

References

- [1] N. Owen, A. Bauman, and W. Brown, Too much sitting: a novel and important predictor of chronic disease risk? *British Journal of Sports Medicine* **43** (2008), 81–83.
- [2] M.T. Hamilton, D.G. Hamilton, and T.W. Zderic, The Role of Low Energy Expenditure and Sitting on Obesity, Metabolic Syndrome, Type 2 Diabetes, and Cardiovascular Disease. *Diabetes* **56** (2007), 2655–2667.
- [3] World Health Organization, *Global recommendations on physical activity for health*, World Health Organization, Geneva, 2010.
- [4] S.A. Prince, T.J. Saunders, K. Gresty, and R.D. Reid, A comparison of the effectiveness of physical activity and sedentary behaviour interventions in reducing sedentary time in adults: a systematic review and meta-analysis of controlled trials: Interventions and sedentary behaviours, *Obesity Reviews* **15** (2014), 905–919.
- [5] Danish Health Authority, <https://www.sst.dk/en/health-and-lifestyle/physical-activity/recommendations/recommendations-for-adults> (accessed Nov 24, 2018).
- [6] T.S. Church, D.M. Thomas, C. Tudor-Locke, P.T. Katzmarzyk, C.P. Earnest, R.Q. Rodarte, et al., Trends over 5 Decades in U.S. Occupation-Related Physical Activity and Their Associations with Obesity, *PLoS ONE* **6** (2011), e19657.
- [7] A.H.Y. Chu, S.H.X. Ng, C.S. Tan, A.M. Win, D. Koh, and F. Müller-Riemenschneider, A systematic review and meta-analysis of workplace intervention strategies to reduce sedentary time in white-collar workers: Workplace interventions and sedentary behaviours, *Obesity Reviews* **17** (2016), 467–481.
- [8] S. Michie, S. Ashford, F.F. Sniehotta, S.U. Dombrowski, A. Bishop, and D.P. French, A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy, *Psychology & Health* **26** (2011), 1479–1498.

- [9] Q.G. To, T.T.L. Chen, C.G. Magnussen, and K.G. To, Workplace Physical Activity Interventions: A Systematic Review, *American Journal of Health Promotion* **27** (2013), e113–e123.
- [10] M. Neuhaus, G.N. Healy, D.W. Dunstan, N. Owen, and E.G. Eakin, Workplace Sitting and Height-Adjustable Workstations, *American Journal of Preventive Medicine* **46** (2014), 30–40.
- [11] .F. Sallis, R.B. Cervero, W. Ascher, K.A. Henderson, M.K. Kraft, and J. Kerr, AN ECOLOGICAL APPROACH TO CREATING ACTIVE LIVING COMMUNITIES, *Annual Review of Public Health* **27** (2006), 297–322
- [12] A.K. Hutcheson, A.J. Piazza, and A.P. Knowlden, Work Site–Based Environmental Interventions to Reduce Sedentary Behavior: A Systematic Review, *American Journal of Health Promotion* **32** (2018) 32–47.
- [13] K. Holtzblatt and H. Beyer, *Contextual Design: Design for life*, 2nd edition. Morgan Kaufmann, 2017.